Pathways Tools SIG
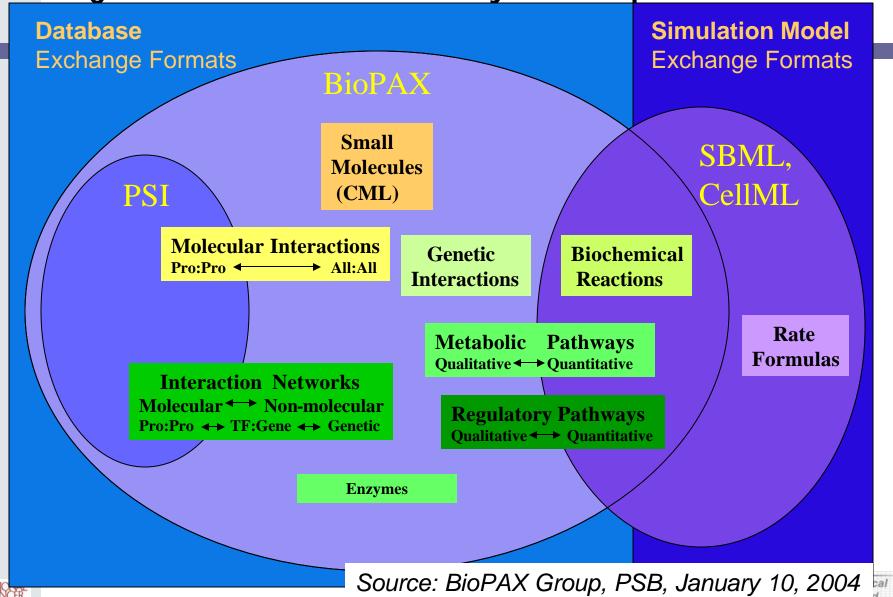**Relevant Standards & Needed Activities**

August 25, 2004

Standards

▸ PSI (http://psidev.sourceforge.net/)

▸ BioPAX (http://www.biopax.org)

▸ SBML (http://sbml.org)

▸ CellML (http://www.cellml.org)

Exchange Formats in the Pathway Data Space

Database
Exchange Formats

Simulation Model
Exchange Formats

BioPAX

SBML,
CellML

PSI

Small Molecules (CML)

Molecular Interactions
Pro:Pro ⟷ All:All

Genetic Interactions

Biochemical Reactions

Rate Formulas

Metabolic Pathways
Qualitative ⟷ Quantitative

Interaction Networks
Molecular ⟷ Non-molecular
Pro:Pro ⟷ TF:Gene ⟷ Genetic

Regulatory Pathways
Qualitative ⟷ Quantitative

Enzymes

Source: BioPAX Group, PSB, January 10, 2004

Protein Standards Initiative
http://psidev.sourceforge.net

▶ Protein-protein interaction

  – Molecular Interaction XML Format Documentation, Version 1.0

  – http://psidev.sourceforge.net/mi/xml/doc/user/

  – V1.0 limited to proteins

▶ Mass spectrometry

▶ General proteomics standard

http://www.biopax.org/Docs/BioPAX_Roadmap.html

BioPAX Roadmap: Overview				
Level	Scope of Ontology		Data Source Compatibility	Biological Rationale
	Physical Entities	Interactions		
Level 1	Small molecules Proteins RNA Complexes	Biochemical Reactions Enzyme Catalysis Transport Catalysis Complex Assembly	GK BioCyc WIT Amaze KEGG	Capture knowledge about known metabolic pathways, protein modifications not included.
Level 2		Binding Interactions	BIND DIP HPRD MINT IntAct PSI format	Add support for molecular binding interactions (inferred interactions, not experimental data interactions).
Level 3	Gene / DNA	Genetic interactions Gene regulation	CSNDB TRANSPATH TRANSFAC	Add support for signaling pathways, regulation of gene expression, and binding interactions involving DNA.

Future Levels	Environmental effects
	DNA
	Cells
	Cell-compartments
	Photons
		Abstract set relationships
		- co-occurrence in:
		  - a pathway
		  - literature abstracts
		  - a cell compartment
		- similar function
		- etc.
			PubGene
			GeneWays
				Allow capture of abstract relationships between biological entities, cell-level interactions, and conclusions from binding assays (annotated with statistical confidence measures).